

# Genetic Algorithm Based LSTM Tactical Risk Sensitive Portfolio Allocation

Student: Chia Wen Cheng

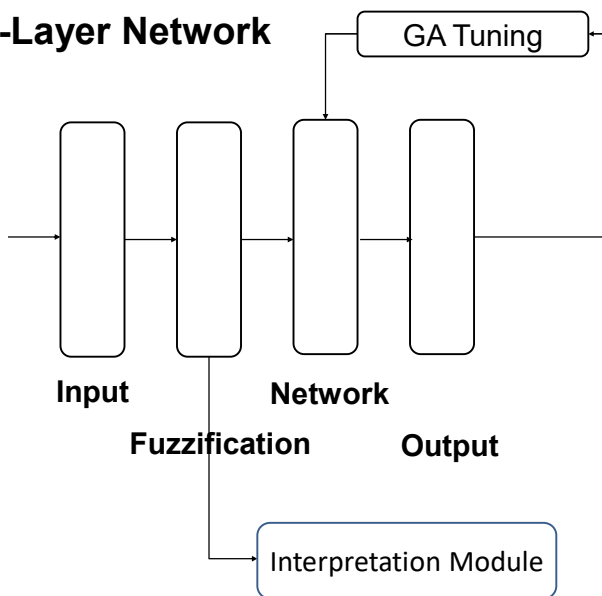
Supervised by: Prof Quek Hiok Chai

## Abstract

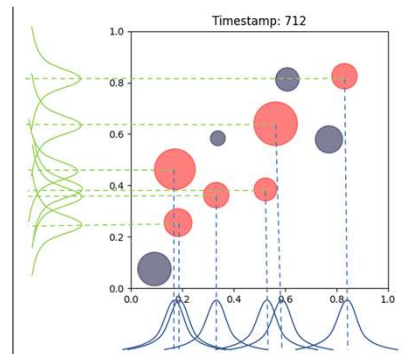
This project proposes an architecture, Self-Discovering Long Short-Term Memory Network (SD-LSTM), which combines fuzzy systems and LSTM. The network is able to self-discover the best network architecture for an input time-series data, that not only makes accurate prediction but also provides interpretability to the input elements.

## Design & Implementation

### 4-Layer Network



1. Input layer takes in the training data
2. Fuzzification of crisp input data
3. Fuzzified output is passed into neural network for training.
4. Output results are used for network architecture tuning.
5. Interpretability can be observed from fuzzified input



Creation of membership functions using an online clustering algorithm, SubStream.

## Results & Application

This proposed architecture demonstrated competitive accuracy across various stock types. It was also able to find a good architecture within a limited number of training generations.

